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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/567,540

10/23/2006

Martin O Leach

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EXAMINER

ALLISON, ANDRAE S

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/567,540	<b>Applicant(s)</b> LEACH ET AL.	
	<b>Examiner</b> ANDRAE S. ALLISON	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 36-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-42 and 50-56 is/are rejected.
- 7) ☐ Claim(s) 43-49 and 57-63 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on February 06, 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/02/2006; 02/06/2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to because:
  - a. Figure 1-7 are objected to because the highlighted areas and the reference letters should be labeled in text. For example, reference letter 'R', should be labeled Reference frame.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 2624

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 64-65 are rejected under 35 USC 112, first paragraph, as failing to comply with the enablement requirement.

As to claim 64, the claim recites the limitation "Computer means programmed to perform the method according to claim 36". Claim 64 is considered a single means claim and does not comply with the enablement requirement of 35.U.S.C 112,1<sup>st</sup> paragraph single means claim, i.e. there is a means recitation that does not appear in combination with another recited element of means. Applicant is directed to the MPEP 2164.08(a) and 2181.

As to claim 65 the claim recites the limitation "A computer readable storage device comprising a computer program computer program for performing the method according to claim 36". Claim 65 is considered a single means claim and does not comply with the enablement requirement of 35.U.S.C 112,1<sup>st</sup> paragraph single means claim, i.e. there is a means recitation that does not appear in combination with another recited element of means. Applicant is directed to the MPEP 2164.08(a) and 2181

It is noted that while the claims may not explicitly recite "means", they are construed as such because they recite a single device to perform all of the claimed functions. See Ex Parte Kung (Bd Pat App + Int) 17 USPQ2d 1545 or Ex Parte Maizel (Bd Pat App + Int) 27 USPQ 2d 1662.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 36-39, 50-53 and 64-65 are rejected under 35 U.S.C. 102(b) as being anticipated by Xu et al (US Patent No.: 6,363,163).

As to independent claim 36, Xu disclose a method of processing a time-sequence of separate image data sets each set comprising a plurality of image data items which each represent the location of an image pixel of the image subject according to a spatially fixed reference frame (previous image of subject - see column 4, lines 60-62) within which the subject is located, the method including the steps of (method for temporal subtraction of medical images taking over a time interval- see column 1, lines 37-47): (a) selecting a plurality of separate image pixel locations within said reference frame (identify portion of medical images that contain anatomic features – see column 5, lines 60-67); (b) selecting from each of a plurality of said separate image data sets those image data items which represent image pixels located at said plurality of separate image pixel locations (note that features are identified in both previous and current images - see column 6, lines 26-35); (c) generating a time-domain image according to said selected image data items wherein those image pixels of the time-domain image sharing a common image pixel location within said reference frame are arranged in said time-sequence in a line containing only those pixels (see column 7,

Art Unit: 2624

lines 35-45 – where matching or registration is done, thus creating the subtracted images).

As to claim 37, Xu teaches the method wherein each image pixel is an image voxel such that each image data item represents the location of an image voxel of the image subject according to a spatially fixed three-dimensional reference frame wherein each image data set contains image data items representing image voxel locations spanning all three dimensions of said reference frame (see Figs 7A and 7B).

As to claim 38, Xu teaches the method wherein the selection of said plurality of image pixel locations at step (a) comprises selecting a target image pixel location (e.g. midsection ) within said reference frame and subsequently selecting all image pixel locations which are intersected by a predefined first locus intersecting said target image pixel location (see column 10, lines 41-54).

As to claim 39, Xu teaches the method wherein said predefined first locus is a line extending through said reference frame (note that the midsection is matched with previous images – see column 10, lines 41-54).

As to claim independent 50, this claim differs from claim 38 only in that claim 50 is apparatus whereas, claim 38 is method and the limitations first selection means, second selection means and image generating means are additively recited. Xu clearly

Art Unit: 2624

teaches a system (see Fig 14) comprising: first selection means (112 – see Fig 14), second selection means (114 – see Fig 1) and image generating means (117 - see Fig 14).

Claims 51-53 differ from claims 37-39 only in that claims 37-39 are method claims whereas, claims 51-53 are apparatus claims. Thus, individual claim 51-53 is analyzed as previously discussed with respect to claim 37-39 above.

As to claim 64, Xu teaches computer means (see Fig 14) programmed to perform the method according to claim 36.

As to claim 65, Xu teaches a computer readable storage device (see column 10, lines 39) comprising a computer program computer program (software – see column 10, lines 36) for performing the method according to claim 36.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 40-42 and 54-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al (US Patent No.: 6,363,163) in view of Clune et al (US Patent



Art Unit: 2624

No.: 7,187,810).

As to claim 40, Xu does not expressly disclose the method wherein said line extends through only one dimension of said reference frame and intersects all pixel locations within a column or a row of pixel locations within the reference frame. Clune discloses a method for correcting image misalignment (column 1, lines 21-24) wherein said line extends through only one dimension of said reference frame and intersects all pixel locations within a column or a row of pixel locations within the reference frame (see Fig 3A-F - where a line intersect common point in all images ). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modified the method for temporal subtraction of Xu with the method for correcting misalignment of Clune to correct image misalignment due to movement of a sample between images during image acquisition and for real-time dynamic image alignment for improved optical diagnosis and assessment (see column 2, lines 1-5).

As to claim 41, note the discussion above, Clune teaches the method wherein said time-domain image is generated such that those image pixels of the time-domain image which are represented by image data items selected from a common image data set are arranged in a line containing only those pixels (note that Fig 3A-3F are a subset of a sequence of image taken from a common subject).

As to claim 42, note the discussion above, Clune teaches the method wherein which said time-domain image comprises a matrix of pixels arranged to define columns

Art Unit: 2624

and rows, wherein each column contains only those image pixels sharing a common pixel location within said reference frame, and each row contains only those image pixels selected from a common image data set or vice versa (see Fig 3A-3F - note that the cross-hairs are located a one common area).

Claims 54-56 differ from claims 40-42 only in that claims 40-42 are method claims whereas, claims 54-56 are apparatus claim. Thus, individual claim 54-56 is analyzed as previously discussed with respect to claim 40-42 above.

### ***Allowable Subject Matter***

8. Claims 43-49 and 57-63 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

9. The prior art made part of the record and not relied upon is considered pertinent to applicant's disclosure.

Weese (Pub No.: 2005/0226527), Boose et al (US Patent No.: 7,421,061), Clune et al(US Patent No.: 7,187,810) all disclose method related to method and apparatus for correcting motion artifact.

***Inquires***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDRAE S. ALLISON whose telephone number is (571)270-1052. The examiner can normally be reached on Monday-Friday, 8:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrae Allison

September 9, 2008

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624